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LANXESS Corporation**Fax Coversheet****Date:** July 24, 2006**Number of pages (including this page):** 22**To:** GROUP NO.: 1713**From:** Nicanor A. Kohncke**Company:** USPTO**Div/Dept:** Law/Intellectual Property**Fax:** 571-273-8300**Fax:** 412-809-1054**Phone:****Phone:** 412-809-2234**DOCKET NO.:** PO7785/LeA 36,414**SERIAL NO.:** 10/694,584

Please find a copy of an Appeal Brief in the above-referenced patent application.

If you have any questions please call.

/lmr

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Appeal Brief
PO-7785
LeA 36,414

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

IN RE APPLICATION OF)	
MARKUS OBERTHUR)	GROUP NO.: 1713
SERIAL NUMBER: 10/694,584)	EXAMINER:
FILED: October 27, 2003)	ROBERT D. HARLAN
TITLE: ANTI-AGING AGENTS FOR)	
RUBBER VULCANIZATES)	
BASED ON ORGANIC)	
COMPOUNDS CONTAINING)	
CONJUGATES AZADIENES)	

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sirs:

This Appeal Brief is filed in the appeal from the Final Office Action dated February 23, 2006, in which Claims 1-2 and 4-6 of the application were finally rejected.

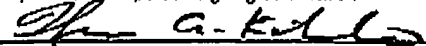
(Please note that a Notice of Panel Decision from Pre-Appeal Brief Review was issued on June 23, 2006, maintaining the rejections of Claims 1-2 and 4-6.)

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

Nicanor A. Köhncke Reg. No. 57,348

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July 24, 2006

Date

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REAL PARTY IN INTEREST

The real party in interest is LANXESS Deutschland GmbH, the assignee not yet of record.

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Appeal Brief

RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences which directly or indirectly affect the present appeal.

STATUS OF CLAIMS

Claims 1, 2, 4, 5, and 6 presently stand rejected.

STATUS OF AMENDMENTS

Claims 1, 2, 4, 5, and 6 currently stand as amended in an Amendment filed on November 29, 2005.

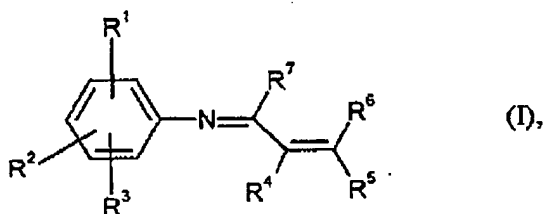
No further amendments have been made to the claims subsequent to the Examiner's final rejection thereof per the Office Action dated February 23, 2006.

SUMMARY OF CLAIMED SUBJECT MATTER

Of the claims involved in the present appeal, claims 1 and 5 are independent claims, while remaining claims are dependent claims.

The subject matter of the presently claimed invention relates to the novel method of reducing the aging of vulcanizates using the anti-aging compounds based on formula I, set forth below, and also to the process for preparing rubber mixtures comprising the anti-aging compounds of formula I. (Page 1, lines 5-11; Page 2, lines 15-21)

The subject matter of the present invention further relates to rubber mixtures having novel anti-aging azadiene compounds, as set forth in the general formula I



(R¹-R⁷ are defined in the specification at page 2 et seq.), which reduce the harmful aging effects caused to vulcanizates by environmental factors such as, for example, thermal aging, fatigue and aging as a results of the effects of oxygen. (Id.)

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Appellant respectfully requests the following grounds of rejection be reviewed on this appeal:

- A. Whether claims 1-2 and 4-6 are unpatentable under 35 U.S.C. 102(b) as being anticipated by Becke et al. (US Patent No. 5,965,678).

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ARGUMENT

- I. Rejection under 35 U.S.C. 102(b) as being anticipated by Becke et al. (US Patent No. 5,965,678) hereinafter referred to as Becke.

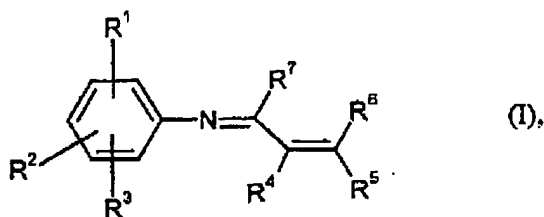
A. Claims 1, 2, and 4

For purposes of this appeal the grouping of claims 1-2 and 4 should stand or fall with independent claim 1.

As best understood, Becke appears to relate to "[a] catalyst system based on monoazadiene metal complexes and their use for the polymerization of unsaturated compounds, especially for the polymerization and copolymerization of olefins and/or dienes." (Col. 1, Lines 4-8). The monoazadiene metal complexes as used in Becke are defined by the formulae therein (Formula I – Formula VIII).

As best understood, all of the monoazadiene compounds of Becke, as represented in the formulae (Formula I – Formula VIII) therein, set forth compounds known as metal complexes. This fact is further reflected in the title to the Becke et al. patent, which is a "Catalyst System Based on Monoazadiene Metal Complexes."

In contrast to Becke, however, stands the present invention, which in at least one embodiment, relates to "[a]nti-ageing agents based on organic compounds containing conjugated azadiene groups, which are capable of providing rubber vulcanisates with long-term protection." (Page 1, Lines 5-7) Independent claim 1 recites, *inter alia*, "A method for reducing the aging characteristics of a rubber vulcanizate comprising admixing an anti-aging agent, based on organic compounds comprising azadiene groups of the general formula (I)...." (Claim 1) Formula I is represented in the claims as:



, wherein R1-R7 are defined further in the claims.

As is immediately evident, formula I does not set forth a metal-complex and is not of the general Becke formula A_mL_nM [monoazadiene]. (See Abstract) Thus while Becke appears to disclose a metal-complex polymerization catalyst, wherein the metal complex includes a monoazadiene, the metal complex polymerization catalyst does not teach or disclose the presently claimed method comprising azadiene anti-aging compounds of formula I of the present invention.

The Office has explained that the elements of Claim 1, as well as the remaining elements of the claims, are taught by Becke, because "Becke teaches the anti-aging of the present claims as part of a catalyst. See Beck[e], col. 7, line 26 through col. 8, line 40. The use of the catalyst as a part in polymerizing olefins and diene to produce rubbers are clearly taught by Becke. See Becke Claims." (Office Action, pp. 2-3 (2/23/06)) After reviewing the referenced sections, along with the remainder of Becke, the Appellant must again respectfully disagree with the Office's assertions as to what is disclosed or suggested to the skilled artisan reading Becke.

At most, the referenced section appears to disclose "[t]he preparation of the monoazadiene metal complex" and the use of the prepared "[c]atalyst system for the polymerization of unsaturated compounds, especially of olefins and dienes." (Col. 7, lines 26-27 and 58-59) It also appears that Becke indicates "rubbers" can be prepared "based on copolymers of ethylene with one or more of the [alpha]-olefins and dienes mentioned." (Col. 8, lines 4-7) Appellant submits that what has been cited as support for the express teaching of the presently claimed invention simply fails to teach or disclose a method comprising an anti-ageing agent based on the

conjugated azadiene compounds of presently claimed formula I.

Nowhere in the cited sections or elsewhere in the reference is the use of an azadiene compound for anti-aging ever considered or suggested. Moreover, there has been no indication or evidence submitted by the Office that the metal-complex compound as set forth in Becke would be expected to have any anti-aging affect. Simply, the reference fails to relate to azadiene compounds other than metal-complexes used for polymerizations. Any other interpretation of Becke such as teaching something other than metal-complex polymerization catalysts fails to appreciate that polymerization is the focus of the Becke invention and that specialized polymerizations are often controlled using metal-complexes. (See Becke et al. at Col. 1) Clearly, what Becke et al. disclose is not that to which the presently claimed invention is directed.

Since the cited art fails to teach all of the elements of the presently claimed invention either expressly or inherently, Appellant respectfully submits that the applied art does not anticipate the present invention because, at the very least, "[a]nticipation requires the disclosure in a single prior art reference of each element of the claim under construction." *W.L. Gore & Associates, Inc. v. Garlock*, 721 F.2d 1540, 1554 (Fed. Cir. 1983); *see also In re Marshall*, 198 U.S.P.Q. 344, 346 (C.C.P.A. 1978).

In view of the foregoing, it is respectfully submitted that claim 1 fully distinguishes over the applied art and is thus allowable. By virtue of dependence from claim 1 it is also submitted that the remaining claims to the group standing and falling with claim 1 are likewise allowable.

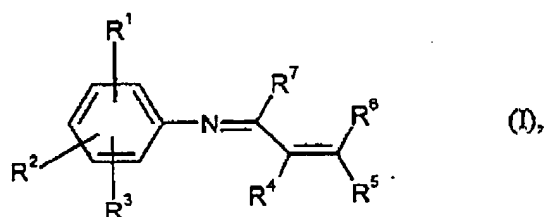
II. Rejection under 35 U.S.C. 102(b) as being anticipated by Becke.

A. Claims 5 and 6

For purposes of this appeal the grouping of claims 5 and 6 will stand or fall together with the Board's consideration of independent claim 5.

As has been explained, Becke appears to relate to "[a] catalyst system based on monoazadiene metal complexes and their use for the polymerization of unsaturated compounds, especially for the polymerization and copolymerization of olefins and/or dienes." (Col. 1, Lines 4-8). The monoazadiene metal complexes as used in Becke are defined by the formulae therein (Formula I – Formula VIII). As best understood, all of the formulae in Becke teach metal complexes used as polymerization catalysts.

The present invention, in at least one embodiment, relates to "[a]nti-ageing agents based on organic compounds containing conjugated azadiene groups, which are capable of providing rubber vulcani[z]ates with long-term protection." (Page 1, Lines 5-7). Independent claim 5 recites, *inter alia*, "A rubber mixture comprising at least one rubber monomer, at least one anti-aging agent and a vulcanizing agent, wherein the anti-aging agent is based on organic compounds comprising azadiene groups of the general formula (I)...." Formula I is set forth as:



, wherein R1-R7 are specifically defined in the claims.

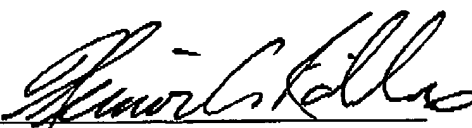
The claimed rubber mixture includes an anti-aging agent comprising an azadiene group, which is simply not taught by the Becke et al. disclosure in which metal-complex polymerization catalysts are provided. Appellant submits this is so whether such metal-complex catalysts include a monoazadiene group within the metal-complex structure or not.

Therefore the azadiene anti-aging element of the present claim is not taught by Becke et al. and Becke fails to anticipate the presently claimed embodiment of the invention.

CONCLUSION

For the aforementioned reasons, it is respectfully submitted that the instant application, including claims 1-2 and 4-6 is presently in condition for allowance; therefore, it is earnestly solicited that the present rejections now considered on appeal be reversed and the claims immediately allowed to issue.

Respectfully submitted,

By 

Nicanor A. Köhncke
Attorney for Appellants
Reg. No. 57,348

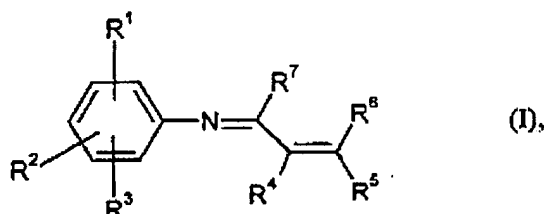
LANXESS Corporation
111 RIDC Park West Drive
Pittsburgh, Pennsylvania 15205-9741
(412) 809-2234
FACSIMILE PHONE NUMBER:
(412) 809-1054

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CLAIMS APPENDIX

1. (Previously Presented) A method for reducing the aging characteristics of a rubber vulcanizate comprising admixing an anti-aging agent, based on organic compounds comprising azadiene groups of the general formula (I)



wherein

R^1 represents hydrogen, straight-chain or branched C_1 - C_{12} -alkyl, C_1 - C_{12} -alkoxy-, C_1 - C_{12} -alkylthio-, C_1 - C_{12} -alkylamino, di- $(C_1$ - C_{12} -alkyl)-amino-, C_6 - C_{14} -aryl-, C_6 - C_{14} -aryloxy-, C_6 - C_{14} -arylthio-, C_6 - C_{14} -arylamino, C_2 - C_{12} -heteroaryl-, C_2 - C_{12} -heteroaryloxy-, C_2 - C_{12} -heteroarylthio-, C_2 - C_{12} -heteroarylamino,

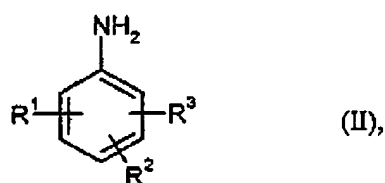
R^2 and R^3 are the same or different and represent straight-chain or branched C_1 - C_{12} -alkyl, C_1 - C_{12} -alkoxy-, C_1 - C_{12} -alkylthio-, C_1 - C_{12} -alkyl-amino, di- $(C_1$ - C_{12} -alkyl)-amino-, benzyl-, 1,1-dimethylbenzyl- or phenyl-,

or together form a 5-10-link aliphatic or aromatic, mono- or polynuclear ring system, which may optionally be interrupted once or more than once by heteroatoms selected from the group consisting of N, O and S,

R^4 to R^7 are the same or different and represent hydrogen, straight-chain or branched C_1 - C_{12} -alkyl-, C_5 - C_{12} -cycloalkyl- or C_6 - C_{14} -aryl-, mono- or polyunsaturated, olefinic or acetylenic, straight-chain or branched C_2 - C_{12} -alkenyl-, C_2 - C_{12} -alkinyl- or C_5 - C_8 -cycloalkenyl, or together form a 5-8-link, aliphatic ring system, which may optionally be

interrupted once or more than once by heteroatoms selected from the group consisting of N, O and S,
with at least one rubber monomer and a vulcanizing agent.

2. (Previously Presented) A method according to Claim 1, wherein the anti-aging agent is prepared by reacting substituted primary aromatic amines of the formula (II)

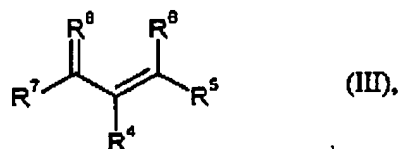


wherein,

R^1 represents hydrogen, straight-chain or branched C_1 - C_{12} -alkyl, C_1 - C_{12} -alkoxy-, C_1 - C_{12} -alkylthio-, C_1 - C_{12} -alkylamino, di- $(C_1$ - C_{12} -alkyl)-amino-, C_6 - C_{14} -aryl-, C_6 - C_{14} -aryloxy-, C_6 - C_{14} -arylthio-, C_6 - C_{14} -arylamino, C_2 - C_{12} -heteroaryl-, C_2 - C_{12} -heteroaryloxy-, C_2 - C_{12} -heteroarylthio- and C_2 - C_{12} -heteroarylamino,

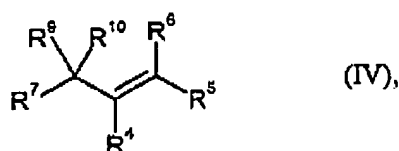
R^2 and R^3 are the same or different and represent straight-chain or branched C_1 - C_{12} -alkyl, C_1 - C_{12} -alkoxy-, C_1 - C_{12} -alkylthio-, C_1 - C_{12} -alkyl-amino, di- $(C_1$ - C_{12} -alkyl)-amino-, benzyl-, 1,1-dimethylbenzyl-, phenyl-,

or together form a 5-10-link aliphatic or aromatic, mono- or polynuclear ring system, which may optionally be interrupted once or more than once by heteroatoms selected from the group consisting of N, O and S, with optionally substituted conjugated 1,3-enones and/or 1,3-enals of the formula (III)



wherein, R^4 to R^7 are the same or different and represent of hydrogen, straight-chain or branched C_1 - C_{12} -alkyl-, C_5 - C_{12} -cycloalkyl- or C_6 - C_{14} -aryl-, mono- or polyunsaturated, olefinic or acetylenic, straight-chain or branched C_2 - C_{12} -alkenyl-, C_2 - C_{12} -alkinyl- or C_5 - C_8 -cycloalkenyl, or together form a 5-8-link, aliphatic ring system, which may optionally be interrupted once or more than once by heteroatoms selected from the group consisting of N, O and S.
and wherein R^8 represents oxygen, sulfur and NR^4 group

and/or their synthetic equivalents of the formula (IV)



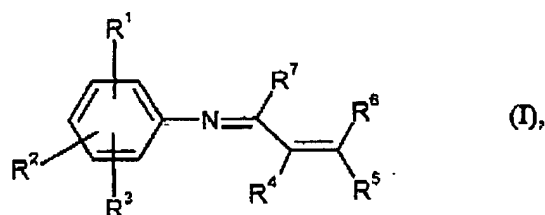
wherein,
 R^9 and R^{10} are the same or different and represent hydroxy, chloro, bromo, straight-chain or branched C_1 - C_{12} -alkoxy, C_1 - C_{12} -alkylthio, C_1 - C_{12} -alkylamino or together form a C_2 - C_{12} -alkanedioxy- or C_2 - C_{12} -alkanediamino group.

Claim 3. Cancelled.

Claim 4. (Previously Presented) A method according to Claim 1 further comprising admixing least one additional anti-aging agent, wherein the mix

ratio of anti-aging agents according to Claim 1 to at least one additional anti-aging agent is 10:1 to 1:10.

Claim 5. (Previously Presented) A rubber mixture comprising at least one rubber monomer, at least one anti-aging agent and a vulcanizing agent, wherein the anti-aging agent is based on organic compounds comprising azadiene groups of the general formula (I)



wherein

R^1 represents hydrogen, straight-chain or branched C_1 - C_{12} -alkyl, C_1 - C_{12} -alkoxy-, C_1 - C_{12} -alkylthio-, C_1 - C_{12} -alkylamino, di- $(C_1$ - C_{12} -alkyl)-amino-, C_6 - C_{14} -aryl-, C_6 - C_{14} -aryloxy-, C_6 - C_{14} -arylthio-, C_6 - C_{14} -arylamino, C_2 - C_{12} -heteroaryl-, C_2 - C_{12} -heteroaryloxy-, C_2 - C_{12} -heteroarylthio-, C_2 - C_{12} -heteroarylamino,

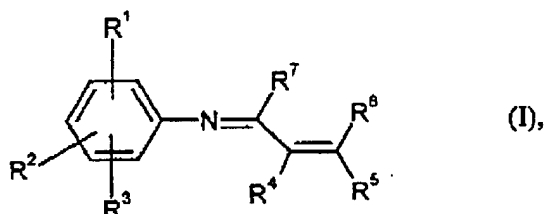
R^2 and R^3 are the same or different and represent straight-chain or branched C_1 - C_{12} -alkyl, C_1 - C_{12} -alkoxy-, C_1 - C_{12} -alkylthio-, C_1 - C_{12} -alkyl-amino, di- $(C_1$ - C_{12} -alkyl)-amino-, benzyl-, 1,1-dimethylbenzyl- or phenyl-,

or together form a 5-10-link aliphatic or aromatic, mono- or polynuclear ring system, which may optionally be interrupted once or more than once by heteroatoms selected from the group consisting of N, O and S,

R^4 to R^7 are the same or different and represent hydrogen, straight-chain or branched C_1 - C_{12} -alkyl-, C_5 - C_{12} -cycloalkyl- or C_6 - C_{14} -aryl-, mono- or polyunsaturated, olefinic or acetylenic, straight-chain or branched C_2 - C_{12} -

alkenyl-, C₂-C₁₂-alkynyl- or C₅-C₈-cycloalkenyl,
or together form a 5-8-link, aliphatic ring system, which may optionally be
interrupted once or more than once by heteroatoms selected from the group
consisting of N, O and S.

Claim 6. (Previously Presented) A process for preparing a rubber mixture
according to Claim 5, comprising mixing one or more rubber monomer with an
anti-aging agent and a vulcanizing agent, wherein the anti-aging agent is
based on organic compounds comprising azadiene groups of the general
formula (I)



wherein

R¹ represents hydrogen, straight-chain or branched C₁-C₁₂-alkyl, C₁-C₁₂-alkoxy-,
C₁-C₁₂-alkylthio-, C₁-C₁₂-alkylamino, di-(C₁-C₁₂-alkyl)-amino-, C₆-C₁₄-aryl-, C₆-
C₁₄-aryloxy-, C₆-C₁₄-arylthio-, C₆-C₁₄-arylamino, C₂-C₁₂-heteroaryl-, C₂-C₁₂-
heteroaryloxy-, C₂-C₁₂-heteroarylthio-, C₂-C₁₂-heteroarylamino,

R² and R³ are the same or different and represent straight-chain or branched C₁-C₁₂-
alkyl, C₁-C₁₂-alkoxy-, C₁-C₁₂-alkylthio-, C₁-C₁₂-alkyl-amino, di-(C₁-C₁₂-alkyl)-
amino-, benzyl-, 1,1-dimethylbenzyl- or phenyl-,

or together form a 5-10-link aliphatic or aromatic, mono- or polynuclear ring
system, which may optionally be interrupted once or more than once by
heteroatoms selected from the group consisting of N, O and S,

R^4 to R^7 are the same or different and represent hydrogen, straight-chain or branched C_1 - C_{12} -alkyl-, C_5 - C_{12} -cycloalkyl- or C_6 - C_{14} -aryl-, mono- or polyunsaturated, olefinic or acetylenic, straight-chain or branched C_2 - C_{12} -alkenyl-, C_2 - C_{12} -alkinyl- or C_5 - C_8 -cycloalkenyl, or together form a 5-8-link, aliphatic ring system, which may optionally be interrupted once or more than once by heteroatoms selected from the group consisting of N, O and S.

Claim 7. Cancelled.

EVIDENCE APPENDIX

None.

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None.

REALTED PROCEEDINGS APPENDIX

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